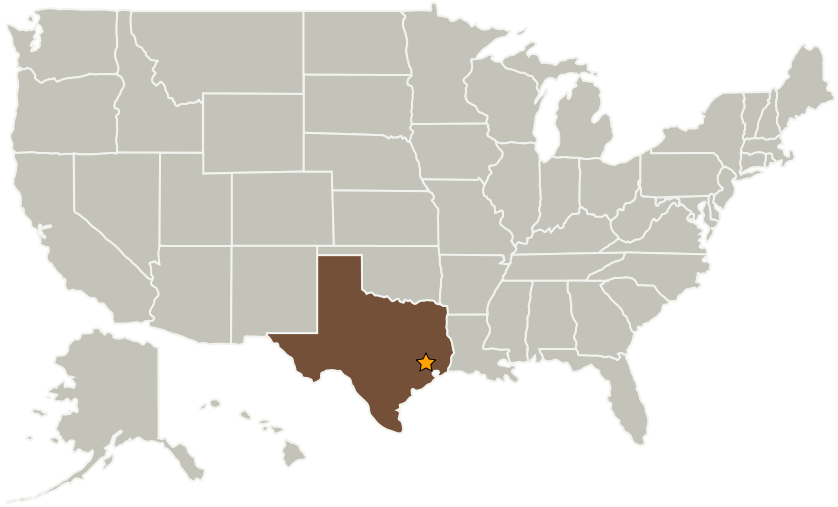
Second Generation of Reagentless Carbon Analyzer for Water Quality Monitoring, Phase I

Completed Technology Project (2005 - 2005)

Project Introduction

Water reclamation is one of the basic functions of the closed regenerative life support systems needed for manned space missions. To assure the quality of the recycled water, particularly for human consumption, monitoring of key water quality parameters, such as total organic carbon (TOC), pH, and conductivity is critical. TOC instruments are used to assess the levels of organic contaminants present in recycled water. NASA seeks for significant improvements in miniaturization, accuracy, precision, and operational reliability, as well as long life, real-time measurement, in-line operation, self-calibration, reduction of expendables, low energy consumption, and minimal maintenance for those monitors. Current available TOC analyzers do not meet those standards. This proposal concerns the development of a small, effective, energy-efficient, reagentless carbon analyzer (RCA). It will combine (i) electrochemical technology to produce two key elements in TOC analysis, acid and oxidant, and (ii) photolysis for the complete oxidation of organic carbons to carbon dioxide. It will also incorporate a microfluidic design. During the Phase I effort, the feasibility of the proposed system will be demonstrated. During the Phase II project, a microgravity-compatible, automated system will be fabricated and delivered to NASA.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Lynntech, Inc.	Supporting Organization	Industry	College Station, Texas

Primary U.S. Work Locations
Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jinseong Kim

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.1 Atmosphere Revitalization